

ABSTRACT

A semiconductor die having multiple solder bumps, each having a diameter less than about 100 microns, and the method for making such a die are described. The solder bumps are preferably about 10 microns in diameter, and the pitch between the solder bumps is less than 100 microns, and preferably less than or equal to 10 microns. A thermal solder jet apparatus is utilized to deposit solder material to form the solder bumps. The apparatus includes a print head having a plurality of solder ejection ports. Each ejection port has an associated gas ejection conduit connected to a chamber containing one or more hydride films. The hydride film is heated to disassociate hydrogen gas. The hydrogen gas rapidly builds up in the conduit which leads to the ejection port which is loaded with a solder material and forces the ejection of the solder material from the port. A controller controls and choreographs the movements of the movable substrate and movable drive so as to accurately deposit material in desired locations on the semiconductor dies.